



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Statistica Spaziale M

2122-2-F8204B010

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#### Learning objectives

The course aims at providing students with a set of methodologies to deal with the estimation and prediction of spatial data.

#### Contents

Exploratory spatial data analysis; analysis of Spatial point pattern; geostatistics; introduction of spatial lattice data.

#### Detailed program

Spatial point processes: homogeneous and non homogeneous Poisson process. CSR tests. Parametric estimation of the intensity function of an inhomogeneous Poisson process.

Geostatistics: exploratory spatial data analysis; variogram, covariogram and correlogram; isotropy and some isotropic variogram models; variogram estimation: empirical and robust variogram, the kernel estimation, parametric modeling of the variogram function: OLS, WLS, GLS and maximum likelihood estimation; simple, ordinary and universal kriging;

Laboratory sessions in R.

## **Prerequisites**

Elements of inferential statistics, stochastic processes and R programming .

## **Teaching methods**

Class lessons and lab sessions.

## **Assessment methods**

Lab assesment and oral examination .

The overall mark is obtained by averaging the marks obtained in each part.

## **Textbooks and Reading Materials**

O. Schabenberger, C.A. Gotway, 2005, Statistical methods for spatial data analysis Chapman & Hall/CRC.

Additional readings, R-codes, datasets and case studies will be made available through the eLearning web page of the course.

## **Semester**

First term of the first semester.

## **Teaching language**

Italian.

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