### Course 2: Time Series

#### Program

1. Basic concepts in time series.  
   1.1. What is a time series?  
   1.2. Graphical representation of time series.  
   1.3. Types of series.

2. Descriptive methods for time series.  
   2.1. Fitting a regression line.  
   2.2. Exponential smoothing.  
   2.3. Basic decomposition of a time series.  
   2.4. Seasonal adjustment and signal extraction.

3. Linear models for time series.  
   3.1. Linear models for stationary series: AR, MA and ARMA.  
   3.2. Linear models for stationary seasonal series.  
   3.3. Non-stationary ARIMA and seasonal ARIMA models.  
   3.4. Box-Jenkins methodology and forecasting.

4. Extensions.  
   4.1. Case study with missing data.  
   4.2. Outlier detection and estimation.  
   4.3. Functional data methods for time series analysis.  
   4.4. Time series clustering.

Practical demonstration: R software.

#### Bibliography


#### Prerequisites

The attendant is supposed to be familiar with software R.