

- Faculté des sciences économiques
- www.unine.ch/seco

Title : Introduction to time series and forecasting

Characteristics

- 6 ECTS credits
- Compulsory course for the master in statistics
- Spring Semester
- Lectures : 4 hours
- Prerequisite: knowledge of probability, statistical inference, regression, linear algebra and stochastic processes.
- Evaluation : written exam 2 hours

Teaching Team

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Objectives: To understand the basics of time series. At the end of the course the student should be able to set up a model to the time series and judge the goodness of fit and the performances of the model in terms of prediction.

Contents: Time Series are observations of stochastic processes. The core of the course is the study of ARMA and ARIMA processes with the three steps of identification, estimation and prediction as well as important classes of non-linear models (GARCH-type). We will discuss about

- Stationary processes
- Modeling the marginal distribution of a stationary process
 - Modeling the tails
- ARMA models
- Modeling and forecasting with ARMA processes.
 - Estimation
 - Forecasting
 - Order selection
 - Goodness of fit tests
- Times series regression and Garch models

Exercises: The students will actively participate in the presentation and explanation of the concepts involved. The assimilation of the concepts and methods will be verified through homework/projects.

Textbooks

- P. Brockwell and R. Davis, *Introduction to Time Series and Forecasting*, Springer, 2002.
- D. Ruppert, *Statistics and Finance: An Introduction*, Springer, 2006.