

# MASTER OF SCIENCE IN WEALTH MANAGEMENT

## MAÎTRISE UNIVERSITAIRE EN GESTION DE PATRIMOINE

### TIME SERIES (S403107)

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6 ECTS

Semester: Autumn

Teaching language: English

### Objective

Time series analysis refers to phenomena in which observations are collected over time and there are correlations among successive observations. Applications cover virtually all scientific areas, including economic, finance, medicine, and climatology. This course provides the Students with the most important concepts and methodologies for dealing with time series analysis.

The course starts from the fundamental definitions (e.g., stationarity and ergodicity) and it covers topics in both time- and frequency domain. In time-domain, both discrete (e.g. autoregressive processes) and continuous time (diffusion processes) models are discussed. In frequency-domain, spectral methods are applied to study long-memory (e.g. autoregressive fractional integrated) processes.

Finally, an overview about multivariate time series and state-space models concludes the course. The theoretical aspects are illustrated by the practical analysis of data sets. A brief review of some (high-school) math skills (e.g. trigonometry, complex numbers, matrix calculus) is done in the exercise sections.

### Assessment

A written exam of 3 hours. The exam is "closed book" and no electronic calculators are needed