

## MASTER Economics Time series

Contacts	Description	Information
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Costin PROTOPOESCU costin.protopopescu@univ-amu.fr	Code: PA-ME5BEC-BECBV3A Domain: Law, Economics, Management	Department: Faculty of Economics and Management <i>Last modification: 09/07/2018</i>

### CONTENT

This course develops the basic theoretical tools for the analysis and estimation of univariate time series models. In particular, it discusses the concepts of stationarity and non-stationarity, unit-root tests, and exposes the techniques for estimating, forecasting and testing ARMA models using practical examples. Finally, it presents some non-linear models for conditional mean and variance.

#### Course outline :

- Brief Review of Statistics and Probability Concepts (pre-requisites)
- Stochastic processes and stationarity
- Classical stationary processes : AR, MA, ARMA
- Estimations techniques for the classical processes
- Forecasting methods for ARMA(p,q) processes
- White noise tests and stability tests
- Optimal choice of orders and Adequacy of parameters
- Univariate Non-Stationary processes and cointegration
- Modelling Nonlinearity of the conditional expectation
- Volatility modelling for univariate processes

### PROFESSIONAL SKILLS

- To master the concepts specific to time series : stationarity and non-stationarity, unit roots, cointegration, auto-regressive processes and moving-average processes.
- Identification, estimation, validation and forecasting of SARIMA models

- Estimation and forecasting the volatility of the univariate financial data

### BIBLIOGRAPHY

- Bourbonnais, R., Terraza M., Analyse des séries temporelles, Dunod, 2016.
- Brockwell, P., Davis, R., Time Series : Theory and Methods, Springer Verlag, 1991.
- Hamilton, J., Time Series Analysis, Princeton University Press, 1994.

### ORGANISATION

- Lectures : 24 hours
- Each session is accompanied by numerical and empirical examples or home works

### FUNDAMENTAL PREREQUISITES

- Foundations of Statistics and Probability
- Introduction to econometrics

### RECOMMENDED PREREQUISITES

Econometrics I : linear model.

### VOLUME OF TEACHINGS

- Lectures: 24 hours

### TRAININGS

#### Master's degree: Economics

- Empirical and theoretical economics
- Economic policy analysis
- Econometrics, big data, statistics
- Quantitative finance and insurance

