- Faculté des sciences économiques
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Time series analysis (5ST2016)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en finance	**Cours: 4 ph**	**cont. continu**	6
Master en méthodologie d'enquête et d'opinion publique	**Cours: 4 ph**	**cont. continu**	6
Master en statistique	**Cours: 4 ph**	**cont. continu**	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante:

Prof. Catalin Starica, Institut de Statistique
Pierre-à-Mazel 7, CH-2000 NEUCHATEL
Office phone: +41 (0) 32 718 14 52 Email: catalin.starica@unine.ch

Objectifs:

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

Contenu:

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
1. Stationary processes
2. Modeling the marginal distribution of a stationary process
- Modeling the tails
3. ARMA models
4. Modeling and forecasting with ARMA processes
- Estimation
- Forecasting
- Order selection
- Goodness of fit tests
5. Times series regression and Garch models (if time permits)

Forme de l'évaluation:

- TP P ES: Continuous assessment including a 2-hour written within-semester test or final project, homeworks, smaller projects, class participation the result of which determine the final grade according to the following weighting system: 60% exam/final project, 20% smaller projects and homeworks, 20% class participation.

- Reexamination session (August-September) : 2h written test

Documentation:

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

Pré-requis:

knowledge of probability, statistical inference, regression, linear algebra, multivariate calculus and stochastic processes

Forme de l'enseignement:

- 6 ECTS credits
- Compulsory course for the master in statistics
- Spring Semester
- Learning activities: 4 hours lectures/presentations per week. The students will actively par-ticipate in the presentation and explanation of the concepts involved.

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