

- Faculté des sciences
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### Time series analysis (3ST2005)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Master en statistique</b>	<b>Cours: 2 ph TP: 2 ph</b>	Voir ci-dessous	6

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

#### Période d'enseignement:

- Semestre Printemps

#### Equipe enseignante

Dr. Clément Chevalier,  
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Assistant:

#### Contenu

The core of the course is the study of time series using models based on ARMA and SARIMA processes. This involves, in short, notions about:

- 1) Methods to estimate and remove a trend and seasonality
- 2) Stationary processes
- 3) ARMA models
- 4) Best linear prediction and advanced algorithms for prediction of ARMA processes
- 5) Algorithms for fitting models to the data
- 6) Order selection and diagnostic plots / goodness of fit tests

#### Forme de l'évaluation

CA graded :The final mark will be based on two elements:

- 1) A project to be handed-in during the semester where the students will perform a complete and critical study of a real-life dataset.
- 2) A 2 hour written test which takes place during the last week of the semester.

Unless the professor and the student both agree on a different date, the reexamination will take place at the same time as the examination for the students of the following year.

The student will pass the 2 hour written examination under the same conditions as the ones which apply to the students of the following year.

This includes possible changes regarding the program of the lecture.

In case of reexamination, the grade obtained for the project will not count.

#### Documentation

The lecture is widely based on the following book:

P. J. Brockwell and R. A. Davis. Introduction to Time Series and Forecasting. Springer, 2002.

#### Pré-requis

- Strong background in probability, linear algebra, linear regression, multivariate calculus.
- Strong background in R programming

#### Forme de l'enseignement

- 6 ECTS credits
- Spring Semester
- Compulsory course for the master in statistics
- Learning activities: 4 hours lectures/exercise series per week.