

- Faculté des sciences économiques
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Computational statistics (5ST2018)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
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:

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Objectifs:

Master the theoretical and practical aspects of the computer based methods in statistics. At the end, the students should be able to apply the methods presented in this course to their statistical analyses.

Contenu:

The course introduces a number of methods that make use of computer resources to do statistical analysis and modeling. Some of these methods use resampling or repeated simulations to compute standard errors, confidence intervals, p-values of statistical tests, etc. The course emphasizes the practical side of the methods, by illustrating the theoretical issues with practical applications using the R software.

- Random variable generation,
- Elements of Monte Carlo statistical methods,
- Resampling methods for estimating and testing (jackknife, bootstrap, resampling methods for model assesment and selection).

Forme de l'évaluation:

TP P: Exercises during the semester + presentation at the end of the semester.

Reexamination session (August-September) : practical exam (2 hours).

Documentation:

- G. H. Givens, J. A. Hoeting (2007), Computational Statistics, Wiley.
- J.E. Gentle (2000), Random number generation and Monte Carlo methods, Springer.
- B. Efron, R. Tibshirani (1993), An Introduction to the bootstrap, Chapman and Hall.
- A.C. Davison, D.V. Hinkley (1997), Bootstrap Methods and their Applications, Cambridge University Press.
- C.P. Robert, G. Casella (2004), Monte Carlo statistical methods, Springer.

Pré-requis:

basic notions of probability and statistics, knowledge of the R software

Forme de l'enseignement:

- 6 ECTS credits
- Compulsory course for master in statistics
- Spring Semester
- Course+exercices: 4 hours