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### Multivariate analysis (3ST2004)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Master en statistique</b>	<b>Cours: 2 ph</b>	Voir ci-dessous	3

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

#### Période d'enseignement:

- Semestre Automne

#### Equipe enseignante

Prof. Yves Tillé  
Institut de statistique,  
Av. de Bellevaux 51  
CH - 2000 Neuchâtel

#### Contenu

1. Brief review of basics of statistics and matrix algebra.
  2. Exploratory Multivariate Analysis: Principal axes techniques (singular value decomposition, principal component analysis, simple and multiple correspondence analysis, discriminant analysis).
  3. Exploratory Multivariate Analysis: Clustering techniques (hierarchical clustering, k-means and related methods, self organizing maps).
  4. Links between these exploratory tools and some classical model based methods such as generalised linear models, discriminant analysis, and regression trees.
- Eventually, since hand calculations are virtually impossible in this field, illustrations will be performed with the aid of the software R.

#### Forme de l'évaluation

2 hours written exam at any exams session. Authorized document - Y. Tillé, Multivariate Analysis (2020) Course notes. without annotations.

#### Documentation

- Y. Tillé, Multivariate Analysis (2020) Course notes.
- L. Lebart, A. Morineau, K. Warwick (1984) Multivariate Descriptive Statistical Analysis, Wiley (Wiley Series in Probability and Mathematical Statistics), New York.
- L. Lebart, M. Piron, A. Morineau (2006) Statistique Exploratoire Multidimensionnelle, Dunod, 4ème édition, 480p (in French).
- K. V. Mardia, J. T. Kent, J. M. Bibby (1980) Multivariate Analysis London; Academic Press (Probability and mathematical statistics), New York.

#### Pré-requis

basics in statistics and linear algebra

#### Forme de l'enseignement

- 3 ECTS credits
- Compulsory course for master in statistics
- Autumn Semester