

MATH-444 **Multivariate statistics**

Cursus	Sem.	Type
Ing.-math	MA2, MA4	Opt.
Mathematics for teaching	MA2, MA4	Obl.
Mathématicien	MA2, MA4	Opt.

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
Exam	Oral
Workload	150h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Remark

pas donné en 2017-18

Summary

Multivariate statistics deals with data consisting of vectors, where each observation is made on a collection of variables. Uncovering the associations between these variables is the main objective. The course teaches methods, some old, some new, that were developed for the analysis of such data.

Content

- the multivariate normal distribution, estimation, tests, conditional distributions
- elliptical multivariate distributions
- model construction: copulas
- principal and independent components
- machine learning: supervised and unsupervised learning
- canonical analysis
- discriminant analysis
- correspondance analysis

Keywords

see the contents of the course

Learning Prerequisites**Required courses**

An introduction to Probability Theory and Statistics

Learning Outcomes

By the end of the course, the student must be able to:

- Demonstrate his understanding of the course content
- Defend a data analysis he/she performed
- Critique the mis-use of multivariate statistical methods
- Justify the use of a method for a particular data set

Transversal skills

- Demonstrate the capacity for critical thinking
- Communicate effectively with professionals from other disciplines.
- Manage priorities.

Teaching methods

Classroom lectures supported by the blackboard, occasional examples shown on the beamer, exercises in class and independent work.

Expected student activities

The students are expected to work in the exercise sessions and finish the exercise sheets.

Assessment methods

Oral examination

Supervision

Office hours	No
Assistants	Yes
Forum	No

Resources**Bibliography**

Consult the moodle pages of the course

Websites

- <http://moodle.epfl.ch>