

# Applied multivariate techniques

A Module of the course: Statistical Models

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## Course schedule

Regular Time: 09:30-12:30 (except for THU 23/02 09:30-11:30)

- TUE 24/01 Matrix decompositions and Dimensionality Reduction. (MKB: Appendix A, Chapter 8)
- THU 26/01 Homeworks/mini-seminars  
Multidimensional Scaling, t-SNE (MKB: Chapter 14, van der Maaten & Hinton (2008) Visualizing High-Dimensional Data Using t-SNE, Journal of Machine Learning Research)
- TUE 31/01 Homeworks/mini-seminars  
Analysis, and Graph Drawing  
Canonical Correlation Analysis and extensions (MKB: Chapter 10)
- TUE 07/02 Homeworks/mini-seminars  
Modern multiple testing approaches
- TUE 14/02 Homeworks/mini-seminars.  
Stability Selection + Knockoff Methods
- THU 16/02 Homeworks/mini-seminars.  
Conformal Inference
- THU 23/02 Homeworks/mini-seminars.  
Summary and insight into further research directions

## Notes

A reference for part of the course is certainly K. V. Mardia, J. T. Kent, & J. M. Bibby (1979) *Multivariate Analysis*. New York: Academic Press [MKB].

The rest of the lectures will be based on research articles and didactic material provided by the teacher.

Despite the use of personal computer - together with a statistical software such as R, Python or Matlab - during the the classes is not mandatory, it may become useful from time to time.

## Teaching, Exams and Final Score

Structure of a prototypical lesson:

- 15 mins: quick exercise or check of the homework (contents of the previous lessons)
- 45 mins: mini-talk/seminar/tutorial by a group of students
- 15 mins: break
- 90 mins: theoretical contents and lab

The final score = 50% quick exercise/Homework + 25% group seminar 1 + 25% group seminar 2  
(D means below 50%; C, B, A are equally spaced on the upper 50%)