UCL Institut de statistique

STAT

STAT2410 Discrete data analysis.

[22.5h+7.5h exercises] 5 credits

This course is taught in the 2nd semester

Teacher(s): Patrick Bogaert, Jean-Marie Rolin
Language: french
Level: 2nd cycle course

Aims

The student will be able to use the basic techniques of Discrete Data Analysis and to apply these to real data using statistical softwares

Main themes

- Multinomial Distribution : marginal and conditional distributions and asymptotic properties
- Two ways Contingency Tables : Independance and Homogeneity, measures of association and particular tests (Fisher, Mac Nemar, etc.).
- Multiple ways Contingency Tables : Mutual, Partial and Conditional Independencies.
- Log-linear Models.
- Conditional Models
- Generalized Linear Models
- Logit and Probit Models
- Multinomial Discriminant Analysis
- Selection of explanatory variables

Content and teaching methods

Content
- Multinomial Distribution : marginal and conditional distributions and asymptotic properties
- Two ways Contingency Tables : Independance and Homogeneity, measures of association and particular tests (Fisher, Mac Nemar, etc.).
- Multiple ways Contingency Tables : Mutual, Partial and Conditional Independencies.
- Log-linear Models.
- Conditional Models
- Generalized Linear Models
- Logit and Probit Models
- Multinomial Discriminant Analysis
- Selection of explanatory variables

Methods
The course is concentrated on the first ten weeks. The following 4 weeks are devoted to the realization by each student of an empirical study of suitable data.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites :
Elementary courses in Probability and Statistics
Evaluation
Each student is provided a data set to be analyzed by the taught techniques.
This analysis is the object of a report orally presented by the student to the Professors.
During this presentation, the Professors may question the student on the matter of the course.
Support
The third reference is the basic reference. Other materials will be provided to students.
Assistant
Isabelle De Macq
References
Bishop Y.M.M., Fienberg S.E. and P.W. Holland (1975) : Discrete Multivariate Analysis, Theory and Practice, M.I.T. Press, Cambridge, Mass.
Dobson Annette (1990) : An Introduction to Generalized Linear Models, Chapman and Hall, London.
Gérard G. and J.M. Rolin (1979) : Analyse des données discrètes, Recyclage en statistique, vol. 3, Université catholique de Louvain, Louvain-la-Neuve.
For more information:
http://www.stat.ucl.ac.be/ISenseignement/Coursetmemoires/Listecours/STAT2410.html
http://www.stat.ucl.ac.be/cours/stat2410/index.html http://www.stat.ucl.ac.be/cours/stat2410/index.html

Other credits in programs

ECGE3DS/MK	Diplôme d'études spécialisées en économie et gestion (Master in business administration) (marketing)	(5 credits)	
MATH22/S	Deuxième licence en sciences mathématiques (Statistique)	(4 credits)	Mandatory
MD3DA/MO	Diplôme d'études approfondies en sciences de la santé (sciences de la motricité)	(5 credits)	Mandatory
STAT2MS	Master en statistique, orientation générale, à finalité spécialisée	(5 credits)	
STAT3DA	Diplôme d'études approfondies en statistique		
STAT3DA/B	diplôme d'études approfondies en statistique (biostatistique et épidémiologie)	(5 credits)	Mandatory
STAT3DA/P	diplôme d'études approfondies en statistique (pratique de la statistique)	(5 credits)	