UCL Université catholique de Louvain

LSTAT2120

2012-2013

Linear models

5.0 credits	22.5 h + 7.5 h	2q

Teacher(s) :	Hafner Christian ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	- Introduction to the general linear model - Multiple univariate regression (selection of variables, model validation, multicollinearity, outlier detection, inference concerning regression coefficients, error variance,...) - Univariate analysis of variance (one or more factors, balanced or non-balanced design, fixed, mixed or random effects model, inference concerning main effects, interactions, error variance,...) - Multivariate regression and multivariate analysis of variance
Aims :	By the end of this course the student will be familiar with the main linear models that are often encountered in statistics, and, by making use of computer packages, the student will be able to solve real data problems. The course stresses more the methodology, the interpretation, and the mechanisms behind linear models, and less the theoretical and mathematical aspects. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content :	The course considers different aspects of general linear models (regression models and analysis of variance) : - selection of covariates - multicollinearity - Ridge regression - model validation - inference concerning the parameters in the model (confidence intervals/hypothesis tests for regression coefficients, error variance,... prediction intervals,...) - balanced or non-balanced designs - fixed, mixed and random effects models - multivariate linear models Teaching methods The course consists of lectures, exercise sessions on computer, and an individual project on computer.
Other infos :	Prerequisites - The student should have followed basis courses in probability, statistics and matrix algebra. - Basic knowledge of SAS is required. Evaluation The evaluation consists of : - an oral exam, which consists mainly of questions related to methodology, comprehension and interpretation of the course - a project on computer, which consists of the analysis of real data Teaching materials The course notes will be distributed during the first lecture. Others Professor : Ingrid Van Keilegom, phone : 010/47 43 30, e-mail : vankeilegom@stat.ucl.ac.be References Arnold, S.F. (1981). The theory of linear models and multivariate analysis, Wiley, New York. Neter, J., Kutner, M.H., Nachtsheim, C.J. and Wasserman, W. (1996). Applied linear statistical models. McGraw-Hill, Boston.

Cycle and year of study :	> Master [120] in Public Health > Master [120] in Mathematical Engineering > Master [120] in Statistics: Biostatistics > Certificat universitaire en statistique > Master [120] in Statistics: General > Master [120] in Mathematics
Faculty or entity in charge:	LSBA