UCL Université catholique de Louvain

LMAT1375

2013-2014

Biometry

4.0 credits	25.0 h + 25.0 h	2q

Teacher(s) :	Schtickzelle Nicolas ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	1) Aims of the course, means, support, evaluation. Reminder: bases of statistical inference. 2) Analysis of variance (1, 2 and 3 way): principle, models, tests, comparison of means, concepts of interaction, nesting, fixed or random factor levels. 3) Correlation, simple and multiple linear regression: model, estimation, inference, prediction, model selection with AIC. 4) Analysis of count data: fitting a probability law, two- and three-way contingency tables. 5) Introduction to generalized linear models. 6) Non parametric methods The theoretical lectures and practical works shall rely upon real cases. Practical works will be realized using computer software.
Aims :	The student shall understand, and become able to use correctly and critically the principal methods for the statistical analysis of biological and environmental univariate data. He perceives the relationship between experimental design and analysis model and the necessity of planning experiments, and becomes familiar with computer-aided data analysis. After completing this course, the student should master the basic methods for the analysis of univariate data, be able to choose the analysis model and method adapted to the design of simple factorial experiments, to analyse and interpret correctly the results of such experiments. He should be able to progress by himself and follow fruitfully advanced lectures on experimental design and data analysis. *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 :	1) Aims of the course, means, support, evaluation. Reminder: bases of statistical inference. 2) Analysis of count data: fitting a probability law, two- and three-way contingency tables (homogeneity tests, independence: marginal, partial, conditional). 3) Simple linear regression: model, estimation, inference, validation, prediction. 4) Multiple regression: modelling the effects, model and design, F-tests and AIC criterion; model selection. 5) One-way analysis of variance: principle, models, tests, comparison of means. 6) Multiple-way Anova: concepts of interaction, nesting, fixed or random factor levels, some designs for heterogeneity control. 7) "What next?" Some indications related to the interests of the students (e.g. linear and non linear modelling, non parametric methods, multivariate analysis, geostatistics, Monte-Carlo methods).
Other infos :	PREREQUISITE Course Mat 1275 "Statistics in the natural sciences", or an equivalent course. EVALUATION Examination in two parts: theory question (written exam), practical application, i.e. solving exercises (oral examination with preparation in a computer class room). SUPPORT Support: course slides are available on iCampus.
Cycle and year of study :	> Master [120] in Environmental Science and Management > Bachelor in Biology > Master [120] in Statistics: Biostatistics
Faculty or entity in charge:	BIOL