

5.00 credits	30.0 h + 7.5 h	Q1
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Teacher(s)	Hafner Christian ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	English at the medium level and concepts and tools equivalent to those taught in the course LSTAT2014
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
Learning outcomes	<b>At the end of this learning unit, the student is able to :</b>  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. 1 The course stresses more the methodology, the interpretation, and the mechanisms behind linear models, and less the theoretical and mathematical aspects.
Evaluation methods	A written exam (60%) and an individual project on a real data set (40%).
Teaching methods	The course consists of main lectures, which provide the main theoretical material but also give many practical examples, and exercise sessions that teach how to implement the methods in a common statistical programming package. The exercise sessions will also help the students to work on their individual projects.
Content	1 The model, specification and interpretation 2 Estimation and geometry 3 Statistical properties of OLS 4 Maximum likelihood estimator 5 Inference and hypothesis tests 6 Multicollinearity 7 Discrete variables and Analysis of Variance 8 Variable selection 9 Heteroskedasticity, autocorrelation 10 Diagnostics (outliers, influential observations) 11 Panel data

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Data Science : Statistic	DATS2M	5		
Master [120] in Biomedical Engineering	GBIO2M	5		
Master [120] in Statistics: Biostatistics	BSTA2M	5		
Master [120] in Mathematics	MATH2M	5		
Master [120] in Statistics: General	STAT2M	5		
Master [120] in Chemistry and Bioindustries	BIRC2M	5		
Approfondissement en statistique et sciences des données	APPSTAT	5		
Master [120] in Mathematical Engineering	MAP2M	5		
Master [120] in Data Science Engineering	DATE2M	5		
Minor in Statistics, Actuarial Sciences and Data Sciences	MINSTAT	5		
Certificat d'université : Statistique et science des données (15/30 crédits)	STAT2FC	5		
Master [120] in Data Science: Information Technology	DATI2M	5		