








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 | <p>At the end of this learning unit, the student is able to :</p> <p>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.</p> <p>1 The course stresses more the methodology, the interpretation, and the mechanisms behind linear models, and less the theoretical and mathematical aspects.</p> |
| 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 | 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. |
| Bibliography | Références données au cours. |
| Faculty or entity in charge | LSBA |

| Programmes containing this learning unit (UE) | | | | |
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| 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 | |  |