UCLouvain

lstat2220

2023

Analysis of survival and duration data

4.00 credits	15.0 h + 5.0 h	Q1

Teacher(s)	Van Keilegom Ingrid ;
Language :	French > English-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Concepts and tools equivalent to those taught in teaching units LSTAT2020 Logiciels et programmation statistique de base LSTAT2120 Linear models
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The aim is to familiarize the student with the basic concepts and models in survival analysis. Moreover, 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 common models in survival analysis, and less the theoretical and mathematical aspects.
Evaluation methods	The evaluation consists of an oral exam (in order to test the general understanding of the course) and of a project on computer (analysis of real data).
Teaching methods	The course consists of lectures and exercise sessions. Recorded videos in English are available on Moodle.
Content	• • Introduction to basic concepts (like censoring and truncation, common parametric survival functions,…) • Nonparametric estimation of basic quantities (Kaplan-Meier estimator of the survival distribution, Nelson-Aalen estimator of the cumulative hazard function,...), the development of some (asymptotic) properties of these estimators, and hypothesis testing regarding the equality of two or more survival curves • Proportional hazards model (estimation of model components, hypothesis testing, selection of explanatory variables, model validation, ...) • Accelerated failure time model (estimation of parameters in model, hypothesis testing, model selection, model validation,...)
Bibliography	• Cox, D.R. et Oakes, D. (1984). Analysis of survival data, Chapman and Hall, New York. • Hougaard, P. (2000). Analysis of multivariate survival data. Springer, New-York. • Klein, J.P. et Moeschberger, M.L. (1997). Survival analysis, techniques for censored and truncated data, Springer, New York.
Other infos	Slides of the course can be downloaded from Moodle.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biomedical Engineering	GBIO2M	4		
Master [120] in Statistics: Biostatistics	BSTA2M	4		
Master [120] in Mathematics	MATH2M	4		
Master [120] in Statistics: General	STAT2M	4		
Master [120] in Mathematical Engineering	MAP2M	4		
Certificat d'université : Statistique et science des données (15/30 crédits)	STAT2FC	4		