UCLouvain

lbire2101

2018

Statistical analysis of spatial and temporal data

3 credits	22.5 h + 15.0 h	Q2

Teacher(s)	Bogaert Patrick ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	Notions of spatial/temporal dependency and its effect on statistical estimation. Quantification and modelling of dependencies through space and time. Random fields theory. Prediction and simulation of correlated data. Mapping and forecasting methods.
Aims	A the end of this activity, the student is able to : · Name, describe and explain the theoretical concepts underlying the stochastic approach for the analysis and the modeling of spatial and temporal data in an environmental framework; 1 • Explain the mathematical concepts and use the mathematical tools that are relevant for statistical exploratory analyses and inferential estimations from environmental data; • Use these concepts and tools in an operational framework in order to make statistical analyses and modeling from a real environmental data set in the framework of a group project; • Explain and justify the methodological choices that are made for the analyses and the modeling steps by integrating the relevant underlying theoretical concepts that have been presented and used during the practical exercises; • Write a concise report based on the main findings for this analysis and modeling work by using a relevant and accurate mathematical language and appropriate figures. M.1.1, M.2.1, M.2.3, M.5.4, M.5.6., M.6.2, M.6.5 - - - - *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".*
Evaluation methods	The examination takes place in two parts : (1) written examination (about an hour); (2) oral examination with a defense of the project completed by the students (abour half an hour)
Teaching methods	Regular course and supervised practical exercises. Practical exercises will take place in a computer room using the Matlab software. Students will work in groups and will process a specific spatial data set. This personal work will be part of a printed report that must be defended during the examination.
Content	This course will complete the basic notions already presented during the courses LBIR 1212 - Probability and Statistics (I) and LBIR 1315 - Probability and Statistics (II). The student will be able to analyze data that are correlated through space and time, as frequently encountered in the agro-environmental context. The course will emphasize the link between the general theory and the practical specificities of environmental data. It should allow the student to model such kind of processes and to use them in a mapping or forecasting context.
Inline resources	Moodle
Other infos	This course follows the LBIR 1212 and LBIR 1315 courses. This course can be taught in English.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Civil Engineering	GCE2M	3		
Master [120] in Statistic: Biostatistics	BSTA2M	3		
Master [120] in Environmental Bioengineering	BIRE2M	3		
Master [120] in Forests and Natural Areas Engineering	BIRF2M	3		
Master [120] in Biology of Organisms and Ecology	BOE2M	3		