Spatial Econometrics

Course title - Intitulé du cours	Spatial Econometrics
Level / Semester - Niveau /semestre	M2 / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Christine THOMAS
Other teacher(s) - Autre(s) enseignant(s)	Thibault LAURENT
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	21
TA Hours - Volume horaire TD	0
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

Christine Thomas christine.thomas@tse-fr.eu office T210 Appointments upon request by email on Wednesdays and Fridays

Thibault Laurent Thibault.Laurent@ut-capitole.fr office T206 Appointments upon request by email

Course's Objectives - Objectifs du cours :

This course is an introduction to the statistical techniques adapted to the treatment of georeferenced data sets. The spatial dimension must be taken into account for modeling the inhomogeneity of a spatial process as well as its spatial dependence structure. We describe the three types of spatial data (geostatistical, areal and point patterns), but the course focuses more on the case of areal data, more frequent in spatial econometrics, and some point process tools in the end. We present exploratory techniques dedicated to spatial data sets. We introduce specific tools such as variograms, weight matrices, Moran index, etc. for studying the autocorrelation structure. Then we present the family of spatial simultaneous autoregressive models (Durbin, spatial lag model, spatial error model). In the framework of these models, we discuss estimation and testing problems, interpretation of coefficients, marginal effects, and prediction. We briefly co ver some additional topics such as kriging and point patterns characteristics. The illustration of these techniques is done with R and the following packages: spdep, GeoXp, sp, geoR, spatstat. Two sessions are devoted to cartography with R in order to present the results of the modeling process. A real data project allows to implement the concepts and techniques discussed during the course. The course takes place in a computer room, allowing immediate implementation. Personal computers are accepted. Attendance to the course is compulsory.

Prerequisites - Pré requis :

Practice of the R software Mathematical statistics

Practical information about the sessions - Modalités pratiques de gestion du cours :

Laptops and tablets accepted. All sessions will be in a computer room.

Grading system - Modalités d'évaluation :

One project and one final exam

Bibliography/references - Bibliographie/références :

LeSage, J., & Pace, R. K. (2009). Introduction to spatial econometrics. Chapman and Hall/CRC. Bivand, R. S., Pebesma, E. J., Gomez-Rubio, V., & Pebesma, E. J. (2008). Applied spatial data analysis with R (Vol. 747248717). New York: Springer.

Distance learning – *Enseignement à distance :*

En cas de nécéssité, un enseignement à distance sera assuré par classe en ligne interactive et TP à distance et forums.