

Mathematical statistics 2

Course title - Intitulé du cours	Mathematical statistics 2
Level / Semester - Niveau /semestre	M1 / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Christine THOMAS
Other teacher(s) - Autre(s) enseignant(s)	Abdelaati Daouia
Other teacher(s) - Autre(s) enseignant(s)	Aude Illig
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	30
TA Hours - Volume horaire TD	15
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

Christine Thomas-Agnan Office number: MF 215 E-mail: christine.thomas@tse-fr.eu Teaching Hours CM: 15 Teaching Hours TD: 7.5 Preferred means of interaction: at the end of class, by appointment

Abdelaati Daouia Office number: MF 305 E-mail: Abdelaati.daouia@tse-fr.eu : E-mail : 1 Teaching Hours CM: 15 Teaching Hours TD: 7.5 Preferred means of interaction: at the end of class, by appointment

Aude Illig (MC002, aude.illig@ut-capitole.fr, preferred means of interaction : email)

Course's Objectives - Objectifs du cours :

The first part of the course is dedicated to the theory of point estimation of a parameter in a parametric statistical model with an introduction to the Fisher information theory. The second part of the course is about the theory of interval estimation and testing theory. The aim of the course is to give the student theoretical tools to compare estimators and tests and have arguments to defend his choices. As in Mathematical Statistics 1, a project is proposed to introduce complementary notions (depending upon year) and to confront theory to practice. The course outline is the following: Elements of information theory. Point estimation (maximum likelihood, method of moments, asymptotic behavior, optimality, efficiency). Interval estimation. Testing theory: rejection region, first and second kind risk, level, power, empirical significance level. Classical tests (about means, variances, proportions, independence) Neyman theory: uniformly most powerful tests for a simple hypotheses. Likelihood ratio tests, tests of a one sided hypotheses in a monotone likelihood ratio model, Wald test, score test.

Prerequisites - Pré requis :

Mathematical Statistics 1

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

Laptops and tablets accepted

Grading system - Modalités d'évaluation :

One midterm exams (40%), one project (20%) , one final exam (40%)

Bibliography/references - Bibliographie/références :

Mathematical Statistics, Jun Shao, Springer texts in Statistics, 1999. Theory of Statistics, Mark Schervish, Springer series in Statistics,1995. A course in mathematical statistics, G. Roussas, Academic Press, second edition, 1997. Initiation à la statistique avec R, Bertrand et Maumy-Bertrand, Dunod, 2010.