UCL Institut de statistique

STAT

STAT2400   Introduction to probability and statistics. Mathematics for the statistician.

[30h+30h exercises] 12 credits

This course is taught in the 1st semester

Teacher(s):   Philippe Lambert, Ingrid Van Keilegom
Language: french
Level: 2nd cycle course

Aims

By the end of the course, the student will be familiar with the basis of mathematics, probability and statistics, necessary to start the courses of methodology and practice of statistics of the program.

Main themes

PART I : Mathematics :
Analysis of functions, limits, continuity, derivatives, integrals, matrix algebra.
Part II : Probability :
Event, probability and conditional probability, Bayes theorem, discrete and continuous random variables, particular laws, density function, distribution function, moments, random vector, limit theorems.
PART III : Statistics :
Point estimation, confidence interval and hypothesis testing with application to the case of normal population(s) or proportions, analysis of variance and linear regression.

Content and teaching methods

Content
PART I : Mathematics :
Analysis of functions, limits, continuity, derivatives, integrals, matrix algebra.
Part II : Probability :
Event, probability and conditional probability, Bayes theorem, discrete and continuous random variables, particular laws, density function, distribution function, moments, random vector, limit theorems.
PART III : Statistics :
Point estimation, confidence interval and hypothesis testing with application to the case of normal population(s) or proportions, analysis of variance and linear regression.
Teaching methods
The course consists of lectures and exercise sessions.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Evaluation
The evaluation consists of a written exam.
Teaching materials
The course notes will be distributed during the first lecture of the course.
Others
Professors :
- Philippe Lambert, phone : 010/47 28 01, e-mail : lambert@stat.ucl.ac.be
- Ingrid Van Keilegom, phone : 010/47 43 30, e-mail : vankeilegom@stat.ucl.ac.be
References :
Dowling, E.T. (1995), Mathématique pour l'économiste, McGraw-Hill, London.
Droesbeke, J.-J. (1997). Eléments de Statistique. Editions de l'Université de Bruxelles & Editions Ellipses.
Khuri, A (1993), Advanced calculus with applications in statistics, Wiley, New York.
Wackerly D.D., Mendenhall W. and R.L. Scheaffer 5th Ed (1996) Mathematical Statistics with Applications, ITP, Duxbury Pres

Other credits in programs

STAT2MS   Master en statistique, orientation générale, à finalité spécialisée (12 credits)