UCL Faculté des sciences

SC

MATH2260 — Calcul des probabilités et principes de l'analyse statistique (y compris la théorie des erreurs d'observation)

[30h+30h exercises] 6 credits

This course is taught in the 1st semester

Teacher(s):	Isabelle De Macq (supplée Rainer von Sachs), Rainer von Sachs
Language:	french
Level:	2nd cycle course

Aims

Introduction into the conceptional understanding of probability theory and statistics and into the most common methods used in practice.

Main themes

First part (Probability): Random events, probabilities, conditional probabilities, Bayes formula, problems of statistical physics. Random variables: Characterisation, Chebyshev inequality, most important particular distributions. Random vectors: Characterisation, independence and correlation. Detailed study of normally distributed random vectors. Law of large numbers and Central Limit Theorem. Approximation of the distribution of a random variable by another random variable.
Second part (Statistics): Estimation of the parameters of a probability distribution. Most important estimation methods and their properties. Application to estimation of a mean, a variance and a proportion. Hypothesis testing relatively to means, variances and proportions. Error of first and second type. One factor analysis of variance and problems of multiple comparisons. Simple linear regression. Tests in correlation problems. Applications to chi-square tests.

Other credits in programs

MATH12	Deuxième candidature en sciences mathématiques	(6 credits)	Mandatory
PHYS12	Deuxième candidature en sciences physiques	(6 credits)	Mandatory
PHYS21/A	Première licence en sciences physiques (Physique appliquée)	(6 credits)	Mandatory
PHYS21/G	Première licence en sciences physiques	(6 credits)	Mandatory
PHYS21/T	Première licence en sciences physiques (Physique de la terre, de l'espace et du climat)	(6 credits)	Mandatory