Faculty of Sciences

MATH2430 Measure theory and probability

[45h+30h exercises] 9 credits

This course is taught in the 1st semester

Teacher(s): Thierry De Pauw, Camille Debiève
Language: French
Level: Second cycle

Aims

The objective of this course is to give a basic formation in measure theory and probability in order to have the tools to properly attack the main problems of statistical analysis and the future formation in stochastic processes.

Main themes

1. Measure theory:
Measurable spaces and measurable functions - outer measures, construction and examples of measures - integrable functions, convergence theorems, Radon-Nikodym theorem, Lp spaces, Fubini theorem.
2. Probabilities:
Probability space - random variables - random variable XX - conditional XX - Independence of random variables - suite convergence of random variables (including the Cramer theorem) - Law of big numbers - characteristic function - central-limit theorem.

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

Support: reference books.
References: Metivier M., Notions fondamentales de la théorie des probabilités, 2ème édition, Dunod, Paris, 1979. Chung K.L., A course in probability theory, 2nd edition, Academic Press, London, 1974.

Other credits in programs

MATH21/E	Première licence en sciences mathématiques (Economie mathématique)	(9 credits)	Mandatory
MATH21/G	Première licence en sciences mathématiques (Général)	(9 credits)	Mandatory
MATH21/S	Première licence en sciences mathématiques (Statistique)	(9 credits)	Mandatory