



## 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,  $L_p$  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