MATH-432

Probability theory

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Cursus	Sem.	Type
Ing.-math	MA1, MA3	Opt.
Mathematics for teaching	MA1, MA3	Opt.
Mathématicien	MA1, MA3	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

The course provides a measure-theoretic introduction to probability.

Content

- general probability spaces, random variables and measurable functions, measures and probabilities
- expectation for a random variable and reminder of integration theory
- independence and the Borel-Cantelli lemmas
- strong and weak laws of large numbers
- central limit theorem

Learning Prerequisites

Recommended courses

First cycle, Advanced analysis A (measure theory)

Learning Outcomes

By the end of the course, the student must be able to:

- Define a probability space
- Define various modes of convergence
- Characterize convergence in distribution
- Analyze tail events via the Borel Cantelli Lemmas

Teaching methods

Ex cathedra lecture and exercises in the classroom

Assessment methods

Exam written
Dans le cas de l'art. 3 al. 5 du Règlement de section, l'enseignant décide de la forme de l'examen qu'il communique aux étudiants concernés.

Supervision

Office hours	No
Assistants	No

Forum	No

Resources

Bibliography

R. Durrett. *Probability: theory and examples*.

Ressources en bibliothèque

- Probability: Theory and Examples / Durret

Websites

- http://mathaa.epfl.ch/prob/enseignement/proba_theory/index.php

Prerequisite for

Probabilities, Stochastic process