

MATH-432

Probability theory

Mountford Thomas

Cursus	Sem.	Type
Mathematics	BA5	Opt.
Statistics	MA1, MA3	Opt.

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

Summary

The course is based on Durrett's text book Probability: Theory and Examples. It takes the measure theory approach to probability theory, wherein expectations are simply abstract integrals.

Content

- (i) Definitions of probability space and random variables
- (ii) independence
- (iii) Different types of convergence for random variables.
- (iv) Weak laws of large numbers
- (v) Borel Cantelli Lemmas and Strong Law of large numbers
- (vi) 0-1 laws
- (vii) Convergence in law
- (vi) Lindeberg-Feller CLT.

Keywords

sigma field
 random variable
 measurable
 convergence a.s.
 independence

Learning Prerequisites**Required courses**

None but it helps to be familiar with measure theory.

Teaching methods

blackboard lectures

Assessment methods

Mostly the final exam but also exercises.

Resources

Moodle Link

- <https://go.epfl.ch/MATH-432>