EPFL

MATH-232	**Probability and statistics**

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Cursus	Sem.	Type
Communication systems	BA3	Obl.
Computer science	BA3	Obl.
HES - IC	H	Obl.

Language of teaching	English
Credits	6
Session	Winter
Semester	Fall
Exam	Written
Workload	180h
Weeks	14
Hours	**6 weekly**
Lecture	4 weekly
Exercises	2 weekly
Number of positions	

Summary

A basic course in probability and statistics

Content

Revision of basic set theory and combinatorics.
Elementary probability: random experiment; probability space; conditional probability; independence.
Random variables: basic notions; density and mass functions; examples including Bernoulli, binomial, geometric, Poisson, uniform, normal; mean, variance, correlation and covariance; moment-generating function; joint distributions, conditional and marginal distributions; transformations.
Many random variables: notions of convergence; laws of large numbers; central limit theorem; delta method; applications.
Statistical inference: different types of estimator and their properties and comparison; confidence intervals; hypothesis testing; likelihood inference and statistical modelling; Bayesian inference and prediction; examples.

Learning Prerequisites

Required courses

Analyse I, II
Algèbre linéaire

Teaching methods

Ex cathedra lectures, exercises and problems

Assessment methods

Written exam

Resources

Notes/Handbook

A polycopié of the course notes, with the problems etc., will be available.

Moodle Link

- https://go.epfl.ch/MATH-232

Prerequisite for

Electrométrie, Théorie du signal, Télécommunications, Information et codage, Fiabilités, ...