PROBABILITY

Information sheet 2025

The aim of this course is to set up the basic mathematical framework for probability theory, to look at some general tools for studying probabilistic model and hopefully also to look at some interesting specific cases.

We will do quite a standard course.

0.1. **Contact.**

- Lecturer: Juhan Aru, juhan.aru@epfl.ch
- Assistants:
  (1) Baptiste Cerclé (head assistant, baptiste.cercle@epfl.ch)
  (2) Philémon Bordereau
  (3) Keefer Rowan
  (4) Mehdi Aziz Jelassi

0.2. **Organization.** Classes, in partly flipped format + notes.

Exercise classes form a very important part of the course! Solving the exercises, thinking about the results, finding examples and counterexamples, questioning definitions and assumptions is the best way to learn the course. Moreover, results of some exercises may be used in the course and might make it to the exam.

You should attempt all exercises yourself first. If you don't know what to do, check the relevant part of the notes and see if one can do something directly from the definitions. If you still don't know what to do, try to ask for a hint first.

Exercises about week n, will be solved in week n + 1 and solutions will go up thereafter. There will be also a forum to support your learning, but the first place to ask questions are the exercise classes.

- Lecture times Tuesday 10h15 to 12h in CE 5.
- Exercise classes Tuesday 13h15-15h:
  (1) BS 150 and BS 270.

0.3. **Supporting material and references.** Here are some other references that you might want to consult. They all treat the material slightly differently than we will, but basically contain all of it.

- The book by R. Dalang and R. Conus "Introduction à la théorie des probabilités" is very nice, concise and clear and in French.
- S. M. Ross has a very nice introductory book "A first course in probability", available both in English and French in the library and I think in the spirit of the course.
- Feller Introduction to Probability Theory and its application is an extremely nice classic, I like the spirit of that book a lot.
- Lecture notes by I. Velenik (Geneva), found on his webpage, are very good and well readable. They do assume knowledge of measure theory but do not plonge into it; in French.
- Lecture notes by I. Manolescu (Fribourg), found on his webpage, are a nicely concise version of Velenik's notes; in French.

But there are many more works on probability, for example by authors like Durrett, Dudley etc... — check what you like!

0.4. **Exam and grading.** The important part of the course is the learning part, but unfortunately there also has to be an exam. It will be rather standard written exam testing what you have learned, what you have understood and whether you manage to apply it. As with any exam - if you have learned the course well, you will easily pass; if you have in addition understood the course well, you will get a very good grade.