**EPFL**

MATH-494 | **Topics in arithmetic geometry**

| Cursus | Sem. | Type |
|---|---|---|
| Ing.-math | MA2, MA4 | Opt. |
| Mathématicien | MA2 | Opt. |

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|---|---|
| Language of teaching | English |
| Credits | 5 |
| Session | Summer |
| Semester | Spring |
| Exam | Oral |
| Workload | 150h |
| Weeks | 14 |
| **Hours** | **4 weekly** |
| Lecture | 2 weekly |
| Exercises | 2 weekly |
| **Number of positions** | |

**Remark**

pas donné en 2023-24

**Summary**

P-adic numbers are a number theoretic analogue of the real numbers, which interpolate between arithmetics, analysis and geometry. In this course we study their basic properties and give various applications, notably we will prove rationality of the Weil Zeta function.

**Content**

Construction and arithmetics of p-adics
Galois theory and the p-adic complex numbers
p-adic analysis
Zeta functions and rationality
p-adic manifolds and integration

**Learning Prerequisites**

**Recommended courses**

- Rings and modules
- Galois theory
- Introduction to differentiable manifolds

**Learning Outcomes**

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

- Demonstrate an understanding of the construction and basic theory of p-adic numbers, as well as being able to do calculations involving them.

**Teaching methods**

course ex-cathedra and exercises

**Resources**

**Moodle Link**

- https://go.epfl.ch/MATH-494