MATH-494

Topics in arithmetic geometry

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

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 2024-25

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