

MATH-511

Number theory II.a - Modular forms

Viazovska Maryna

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	

Summary

In this course we will introduce core concepts of the theory of modular forms and consider several applications of this theory to combinatorics, harmonic analysis, and geometric optimization.

Content**During the course we will learn:**

- Basic definitions and facts of the theory of modular forms
- Combinatorial properties of the Fourier expansions of modular forms
- Applications of modular forms to harmonic analysis
- Modular forms and the sphere packing problem

Keywords

Modular forms, Modular group, linear fractional transformations, theta functions

Learning Prerequisites**Required courses**

Complex analysis
Fourier analysis

Recommended courses

Algebraic topology, classification of compact surfaces

Assessment methods

Oral

Resources**Bibliography**

1. **A first course in modular forms.** Fred Diamond; Jerry Shurman; 2005
2. **The 1-2-3 of modular forms : lectures at a summer school in Nordfjordeid, Norway.** Don Zagier; 2008

3. **Topics in Classical Automorphic forms.** Henryk Iwaniec

Ressources en bibliothèque

- [A first course in modular forms / Diamond](#)
- [The 1-2-3 of modular forms / Zagier](#)
- [Topics in classical automorphic forms / Iwaniec](#)

Moodle Link

- <https://go.epfl.ch/MATH-511>