

MATH-482

Number theory I.a - Algebraic number theory

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Cursus	Sem.	Type
Mathematics	BA5	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Algebraic number theory is the study of the properties of solutions of polynomial equations with integral coefficients; Starting with concrete problems, we then introduce more general notions like algebraic number fields, algebraic integers, units, ideal class groups...

Content

- Basics on rings and modules, lattices in \mathbb{R}^n
- Dedekind rings
- The ring of integers of a number field
- Application to Galois theory
- Finiteness of the ideal class group
- Dirichlet's units theorem
- Applications

Keywords

Rings, Fields, integers, ideals, lattices

Learning Prerequisites**Required courses**

MATH-215

Recommended courses

MATH-311

MATH-313

MATH-317

Learning Outcomes

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

- Quote the main results of the course

- Use the main results of the course
- Prove the main results of the course

Teaching methods

ex-cathedra

Expected student activities

attendance to the course and active participation to the exercises sessions

Assessment methods

written exam

Supervision

Assistants	Yes
Others	moodle page

Resources**Notes/Handbook**

a pdf of the course will be provided

Moodle Link

- <https://go.epfl.ch/MATH-482>

Prerequisite for

MATH-417
MATH-489
MATH-494
Fields medal