

MATH-482

Algebraic number theory

Michel Philippe

Cursus	Sem.	Type
Mathematics	BA6	Opt.

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
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...

Learning Prerequisites**Required courses**

Rings and fields

Recommended courses

Galois Theory

Introduction à la théorie analytique des nombres

Rings and modules

Learning Outcomes

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

- Synthesize the main concepts of algebraic number theory
- Solve problems related to algebraic number theory

Teaching methods

cours ex-cathedra et exercices

Expected student activities

De part sa nature, la théorie algébrique des nombres combine des techniques provenant de plusieurs domaines (algèbre linéaire, algèbre commutative, analyse, géométrie). Il est indispensable d'avoir une bonne maîtrise de chacun d'eux. On attend une présence active aux séances de cours et surtout aux séances d'exercices. On demandera notamment aux étudiants de venir présenter leurs solutions au tableau.

Assessment methods

examen écrit

Dans le cas de l'art. 3 al. 5 du Règlement de section, l'enseignant décide de la forme de l'examen qu'il communique aux étudiants concernés.

Supervision

Office hours	No
Assistants	Yes
Forum	No
Others	moodle

Resources**Bibliography**

Samuel, algebraic number theory

Ressources en bibliothèque

- [Théorie algébrique des nombres / Samuel](#)

Prerequisite for

Topics in number theory.

Applications of number theory: eg. cryptography

Solving the Birch-Swinnerton-Dyer conjecture and win one of the Millenium Prizes (1M USD) from the Clay Mathematics Institute.

Receiving the Fields medal