

MATH-428

Introduction to Algebraic geometry

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Cursus	Sem.	Type
Ing.-math	MA2, MA4	Opt.
Mathématicien	MA2	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 geometry is a central subject of modern mathematics, lying between differential geometry and number theory. The course will give an introduction to algebraic geometry, arriving at the end to the Riemann-Roch theorem for curves and to Bézout's theorem.

Content

- Quasi-projective varieties
- Dimension
- Regular and rational functions
- Birational equivalence
- Regular varieties
- Normal varieties
- Divisors
- Linear systems
- Sheaves
- Čech cohomology
- Riemann-Roch theorem for curves

Learning Prerequisites**Required courses**

- Linear algebra,
- Théorie des groupes
- Anneaux et corps
- Rings and Modules

Recommended courses

- Topology I & II
- Algebraic topology

- Differential geometry
- Algebraic number theory

Learning Outcomes

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

- Analyze basic problems in algebraic geometry of curves and solve them.

Teaching methods

Ex cathedra lecture with exercises

Assessment methods

The final grade will be assigned based on the cumulative points of the student obtained from handed in homework solutions and from the written exam. The weights of the two parts are:

30% - homework

70 % - written exam

The homework will be required to hand in on a weekly basis.

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

Resources

Notes/Handbook

There will be typed (latex) notes distributed on moodle.