

MATH-428

**Introduction to Algebraic geometry**

Patakfalvi Zsolt

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

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
Exam	Written
Workload	150h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Courses	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**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
- Birational equivalence
- Regular varieties
- Normal varieties
- Divisors
- Linear systems
- Sheaves
- Čech cohomology
- Riemann-Roch theorem for curves
- Intersection product on smooth projective surfaces
- Bézout's theorem

**Learning Prerequisites****Required courses**

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

**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**

Written exam; bonus for exercises

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.