EPFL

MATH-535   **Topics in 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 curves and surfaces are the first examples of algebraic varieties to consider. In this course we will study classical topics in the theory of algebraic curves and surfaces applying methods of schemes and cohomology. The course will include many explicit examples and calculations.

Content

- Recap: Divisors, Cech cohomology and morphisms to projective space
- Rienann-Roch and Serre duality for curves
- Hurwitz theorem
- Ample line bundles and embeddings
- Regular surfaces
- Intersection theory on regular surfaces
- Monoidal transformations and desingularization

Learning Prerequisites

Required courses

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

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 surfaces and solve them.

Teaching methods

Ex cathedra lecture with exercises

Assessment methods

The final grade will be assigned based on the cummulative 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 any other week.
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