- Faculté des sciences
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Affine and projective geometry (3MT2064)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Bachelor en mathématiques	**Cours: 2 ph Exercice: 2 ph**	**oral: 30 min**	6
Bachelor en sciences et sport (mathématiques)	**Cours: 2 ph Exercice: 2 ph**	**oral: 30 min**	6
Master en mathématiques	**Cours: 2 ph Exercice: 2 ph**	**oral: 30 min**	6
Pilier principal B A - mathématiques	**Cours: 2 ph Exercice: 2 ph**	**oral: 30 min**	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante:

Lecturer: Relinde Jurrius
Assistant: Giulia Bianco

Objectifs:

There are two methods to deal with planar geometry. One can either use an axiomatic approach and reason on lines, planes, circles, triangles, etc: we find this approach for example in Euclid's "Elements". On the other hand, one can use coordinates, like in calculus. In this course, we study affine and projective planes. An affine plane is a generalization of the well-known Euclidean plane, the projective plane takes away the notion of paralel lines (so all lines intersect). Our main result will be to show that we can coordinatize the affine and projective planes by using coordinates from a division ring, just like we can coordinatize the Euclidean plane by using real numbers as coordinates.

Contenu:

Definitions of the affine and projective plane, Desargues' theorem, addition and multiplication on an affine line, coordinatization of the affine and projective plane, theorems of Pappus and Pascal.

Forme de l'évaluation:

Oral exam of 30 minutes.

Documentation:

Course notes will be made available on Claroline. The course is based on the book "Affine and projective geometry" by M.K. Bennett.

Pré-requis:

(Linear) algebra

Forme de l'enseignement:

Per week: 2 hours of lectures (in English) and 2 hours of exercise session. Students are expected to weekly hand in written homework.