UCL Faculté des sciences

SC

MATH1127 Geometry 2nd part

[67.5h+15h exercises] 6 credits

This course is taught in the 2nd semester

Teacher(s): Francis Borceux
Language: french
Level: 1st cycle course

Aims

To continue the study of geometry, initiated in the course MATH1126, by studying this time problems motivated by the intrinsic dynamics of the topic itself. A special attention will be paid to introducing the student to various complementary aspects of geometry.

Main themes

Contents
Development of a selection of topics of the following kind.
1. Advanced topics of euclidean geometry, like inversions, conformal transformations, and so on.
2. Introduction to projective geometry on a field, with the study of topics like homogenous coordinates, cross ratio, theorems of Desargues and Pappus, conics, poles and polar lines, and so on.
3. An introduction to non-euclidean geometry: elliptic and/or hyperbolic geometry, limit parallels, default of a triangle, Klein and Poincaré models, links with riemannian geometry, and so on.
4. An introduction to algebraic geometry, for example in the special case of the projectif complex plane. Topics like multiple points, inflexion points, Bezout theorem, cubics, rational curves, and so on.
5. Some complements of riemannian geometry, like the Gauss-Bonnet theorem and its link with the Euler-Poincaré characteristics.

Content and teaching methods

The course is taught in English.

Other credits in programs

MATH12	Deuxième candidature en sciences mathématiques	(6 credits)	Mandatory