

ALGEBRAIC GEOMETRY I

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The course is open to students of the Master's degree in Mathematics (Laurea Specialistica) and to students of the Master Mundus ALGANT program.

When second semester (beginning 1st march 2014), 64 hours (8 credits).

Exam: written.

Description

We start with the notions of affine and projective varieties and their basic properties over an algebraically closed field. We will try to link their study to the classical examples the student will have in mind: plane curves, conics. In the meantime we will try to develop new tools and constructions always in the "classical affine and projective frameworks". We will try study invariants, intersections, regularity, rational maps. This should lead, naturally, to the concept of scheme on a more general base than an algebraically closed field. We will try to study the properties of the schemes and the different maps one can construct.

Prerequisites some basic commutative algebra and basic notion of plane curve and conics.

Program: Affine and projective varieties over an algebraically closed field. Maps: regular and rational functions. Singular and non singular points. Classical examples. Schemes. Sheaves. First properties of schemes and maps of schemes. Sheaves on schemes.

References

- R. Hartshorne *Algebraic Geometry*, Springer 1977.
- A. Holme *A royal road to algebraic geometry*, Springer 2011.
- M. Beltrametti, D. Gallarati etc.. *Lectures on Curves, Surfaces and Projective Varieties. A classical view to algebraic geometry*, (F. Sullivan trad), EMS Textbook in math. 2009.
- K. Ueno *Algebraic Geometry 1,2,3*, Translations of Math. Monographs 185, 197,218. AMS (1999,2001,2003).