UNIVERSITÀ DI PISA

ELEMENTS OF ALGEBRAIC GEOMETRY

RITA PARDINI

Anno accademico	2022/23
CdS	MATHEMATICS
Codice	049AA
CFU	6

Moduli	Settore/i	Tipo	Ore	Docente/i
ELEMENTI DI GEOMETRIA ALGEBRICA	MAT/03	LEZIONI	48	RITA PARDINI

Learning outcomes

Knowledge
The student who successfully completes the course will have a solid knowledge of the basics of algebraic geometry over an algebraically closed field, in particular: affine and quasi-projective varieties, morphisms, tangent space and dimension.

Assessment criteria of knowledge
At the end of the course the student will be interviewed in order to ascertain the understanding of the course topics.

Skills
The student will acquire the basic notions that will allow them to progress in learning algebraic geometry and be able to read the scientific literature in the field.

Assessment criteria of skills
Oral interview, to test the ability of making connections between different notions and applying them to examples.

Behaviors
The student will understand the basic notions and results of algebraic geometry and will be able to apply them.

Assessment criteria of behaviors
Oral interview to test the ability of applying in concrete examples the notions taught in the course.

Prerequisites
Basic notions of linear algebra, commutative algebra and topology, such as are usually taught in the first two years of the undergraduate mathematics degree program.

Syllabus
Projective spaces . Plane curves: local geometry, Bezout's theorem. Plane cubics. Nullstellensatz. Affine and quasi-projective varieties: Zariski topology, irreducible decomposition, morphisms, rational maps, dimension, tangent spaces. Segre varieties, Veronese varieties, Grassmannians. Dimension of an irreducible quasi-projective variety. Tangent space and singular points.

Bibliography
Recommended reading includes parts of the following texts:
1) E. Fortuna, R. Frigerio, R. Pardini, Geometria proiettiva, Problemi risolti e richiami di teoria, UNITEXT Springer (2011).
2) M. Reid, Undergraduate Algebraic Geometry, Cambridge University Press (1988).
3) I. R. Shafarevich, Basic Algebraic Geometry 1, (Second edition), Springer (1994). Further bibliography will be indicated during the course.

Non-attending students info

It is advisable to contact the teachers.

Assessment methods

The exam consists in an oral test. The candidate will be interviewed by two teachers and he will be asked to:
- explain some of the course topics, organizing autonomously the exposition and using appropriate language and terminology.
- set up, and sometimes carry out, the resolution of problems related to the course topics.

Updated: 12/09/2022 10:29