

# MATH0076 Algebraic Geometry

<i>Year:</i>	2024–2025
<i>Code:</i>	MATH0076
<i>Level:</i>	7 (UG)
<i>Normal student group(s):</i>	UG Year 4 Mathematics degrees
<i>Value:</i>	15 credits (= 7.5 ECTS credits)
<i>Term:</i>	1
<i>Assessment:</i>	60% examination, 30% midterm and 10% coursework
<i>Normal Pre-requisites:</i>	Some background in algebra and topology is required.
<i>Lecturer:</i>	Dr D Beraldo

## *Course Description and Objectives*

Algebraic Geometry is the study of algebraic varieties, spaces which are defined by polynomial equations in several variables. Although the subject goes back to Descartes, it is still one of the most thriving research areas of pure mathematics. It is intimately connected to commutative algebra, and closely linked to many other areas of mathematics including number theory, differential geometry, and representation theory

Our aim is to introduce basic notions of algebraic geometry, using lots of explicit examples

## *Recommended Texts*

- R. Hartshorne. *Algebraic Geometry*
- W. Fulton. *Algebraic curves*
- M. Reid. *Undergraduate algebraic geometry*
- I.R. Shafarevich. *Basic algebraic geometry*

## *Detailed Syllabus*

- Affine algebraic varieties: definitions, basic properties.
- Tangent spaces, singularities, dimension.
- Morphisms, rational and birational maps.
- Projective varieties.
- Blow-ups.
- Divisors. Bezout's theorem.