

## 27043 - Algebraic Curves

### Syllabus Information

**Academic Year:** 2020/21

**Subject:** 27043 - Algebraic Curves

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 453 - Degree in Mathematics

**ECTS:** 6.0

**Year:** 4

**Semester:** First semester

**Subject Type:** Optional

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

#### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem-solving sessions, tutorials and autonomous work and study.

#### 4.2.Learning tasks

This course is organized as follows:

- **Lectures**
- **Problem-solving sessions** and oral presentations
- **Tutorials**
- **Autonomous work and study**

The teaching activities and assessment tasks will take place in a face-to-face mode, except in the case that, due to the health situation, the dispositions emitted by the competent authorities and by the University of Zaragoza compel to take them in a telematic form.

#### 4.3.Syllabus

This course will address the following topics:

- **Topic 1. Algebraic Preliminaires**
  - Commutative rings and ideals.
  - Rings of fractions.
  - Polynomial rings. Homogeneous polynomials.
  - Noetherian rings. The Hilbert basis theorem
- **Topic 2. Varieties and morphisms**
  - Affine algebraic sets and ideals of sets of points.
  - Hilbert's nullstellensatz.
  - Polynomial maps, Zariski's topology, morphisms and rational maps.
  - The projective space. Projective algebraic sets.
  - Varieties in a multiprojective space.
- **Topic 3. Algebraic Plane Curves**
  - Parameterizable curves.
  - Local properties: singularities, tangents and multiplicities.
  - Multiplicities local rings.
  - Bézout's theorem.

#### **4.4.Course planning and calendar**

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle.

#### **4.5.Bibliography and recommended resources**

[http://biblos.unizar.es/br/br\\_citas.php?codigo=27043&year=2020](http://biblos.unizar.es/br/br_citas.php?codigo=27043&year=2020)