



# GÖTEBORG UNIVERSITY

Faculty Board of Science

## MMA320 Introduction to Algebraic Geometry

### 7.5 higher education credits

*Second Cycle*

This syllabus is the binding document.

#### 1. Confirmation

The syllabus was confirmed by the Department of Mathematical Sciences on June 1, 2007 to be valid from July 1, 2007. The syllabus was revised on December 8, 2009 to be valid from July 1, 2010. Field of education: Science. Responsible department: Mathematical Sciences.

#### 2. Position in the educational system

The course Introduction to Algebraic Geometry, 7.5 higher education credits, is one of several single subject courses included in the Masters Program in Mathematical Sciences. The course is also open for eligible students outside the program. It is further one of the courses in the post-graduate program in Mathematics.

#### 3. Entrance qualifications

The prerequisite for the course Introduction to Algebraic Geometry is the equivalent of 90 higher education credits in Mathematics, including at least 7.5 higher education credits from the second cycle and the course MMG500 Algebraic Structures.

#### 4. Course content

Affine algebraic varieties, morphisms and rational functions, projective varieties, group law on cubic curves, quasi-projective varieties, finite maps, dimension, lines on a cubic surface, tangent space, singular points and blowing up.

#### 5. Learning outcomes

After completing the course, the student will

- understand the concept of affine and projective varieties
- be able to describe the group law on a cubic curve
- know the definition of dimension of varieties

- be able to prove the existence of lines on a cubic surface and determine their configuration
- understand the concept of tangent space and the characterisation of smooth points
- be able to resolve plane curve singularities.

## **6. Required reading**

List of required reading enclosed.

## **7. Assessment**

An examination will be given at the end of the course. A student who has failed a test twice has the right to change examiner, unless weighty arguments can be invoked. For this, the student must send a written request to the board of the department.

## **8. Grading scale**

The grades are Fail (U), Pass (G), and Pass with Distinction (VG).

Students who are contractually entitled to ECTS grades should inform the examiner about this no later than one week after the start of the course.

Students without such entitlement will not be awarded ECTS grades. Grades will be converted into ECTS terminology according to a standard model approved by the University President.

## **9. Course evaluation**

Oral and/or written course evaluation will be performed. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.

## **10. Additional information**

The language of instruction is English unless all involved are Swedish speakers.