# Advanced Algebra

## Prof.ssa Clara Franchi

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The aim of the course is to present to students a general comprehension of the fundamental facts of the Galois Theory of algebraic extensions and of its applications to finite fields and to the solution of algebraic equations.

At the end of the course, a student is expected to know the fundamental concepts and results of Galois Theory and he will be able to apply them to solve simple problems.

***COURSE CONTENT***

* Recall on cyclic groups and permutation groups.
* Group actions.
* Recall on fields and polynomial rings.
* Algebraic and trascendental field extensions.
* Splitting fields and algebraic closure.
* Normal and separable extensions.
* Galois extensions.
* Fundamental Galois Theorem.
* Finite fields.
* Cyclotomic polynomials.
* Solvability by radicals of algebraic equations.

***READING LIST***

Notes given by the teacher.

***TEACHING METHOD***

Lectures and exercise sessions.

***ASSESSMENT METHOD AND CRITERIA***

The exam consists of an oral test in which the student is asked on the programme of the course.

The aim of the exam is to test the degree of assimilation of the concepts, the results and the proofs presented during the course, by means of an exposition and a discussion of some items of the programme, not excluding references to prerequisites, links to different topics or a discussion of some examples.

Evaluation will be based on the correctness of the concepts and results presented, their logic and methodologic accuracy, and the correctness and strength of the exposition. Assimilation of the concepts and the personal reworking will also be considered.

***NOTES AND PREREQUISITES***

A sufficient knowledge of the basic notions of the Algebra course is expected.

Prof. Clara Franchi meets the students in her room, before or after every lecture, and on appointment.

*Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.*