



DEPARTMENT OF MATHEMATICAL SCIENCES

MMA350 Algebraic Number Theory, 7.5 credits

Algebraisk talteori, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2019-05-07 to be valid from 2019-09-02, autumn semester of 2019.

Field of education: Science 100%

Department: Department of Mathematical Sciences

Position in the educational system

The course can be part of the following programme: 1) Mathematical Sciences, Master's Programme (N2MAT)

Main field of studies

Mathematics

Specialization

A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of 90 hec in mathematics and basic Galois theory equivalent to parts of the course MMA310 Galois Theory. In Galois theory, the requirements are: knowledge of separable field extensions, the fundamental theorem of Galois theory, the existence of the algebraic extension of the rational numbers, and the embedding of number fields therein.

Learning outcomes

On successful completion of the course the student will be able to:

- give examples of rings of algebraic integers and describe their basic properties,
- give an account of Minkowski theory,
- use the methods of the course to analyze examples, solve problems, and prove theorems in algebraic number theory on the level of the course,

- prove the main theorems in the course.

Course content

Rehearsal of basic field theory. Algebraic integers, ideals and number fields, lattices and Minkowski theory. Class numbers including Dirichlet's unit theorem.

Form of teaching

Language of instruction: English

Assessment

The examination consists of written assignments and a written or oral examination. During the course, there may be optional assignments that give bonus points on the exam. Examples of such assignments are small written tests, labs, and oral or written presentations. Information about this is found on the course home page.

If a student, who has failed the same examined element on two occasions, wishes to change examiner before the next examination session, such a request is to be submitted to the department in writing and granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance). In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, though at most two years after the course has ceased/been changed.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Course evaluation

The course is evaluated with an anonymous questionnaire and/or a discussion with the student representatives. The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

For a list of course literature, see:

<https://www.chalmers.se/sv/institutioner/math/utbildning/grundutbildning-goteborgs-universitet/kurslitteratur/Sidor/Kurslitteratur-i-matematik.aspx>