MMA310   Galois Theory, 7.5 credits

Galoisteori, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2018-02-12 and was last revised on 2019-12-16 to be valid from 2019-12-16, 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 programmes: 1) Mathematical Sciences, Master's Programme (N2MAT), 2) Mathematics and Learning, Master's Programme (N2MOL) and 3) Bachelor's Programme in Mathematics (N1MAT)

Main field of studies	*Specialization*
Mathematics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of 90 credits in mathematics, including the course *MMG500 Algebraic Structures*.

Learning outcomes

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

- determine the splitting field of a polynomial,
- formulate Dedekind's lemma on field automorphisms,
- relate intermediate field extensions of a Galois extension to subgroups of its Galois group,

- decide when a polynomial equation is solvable by radicals by means of its Galois group,
- apply Galois theory to geometric constructions with ruler and compass.

Course content

Prime fields. Characteristic of a field. Algebraic extensions. Splitting fields. Finite fields. Automorphisms of fields. Galois groups. Normal extensions. Separable extensions. Galois extensions. Solubility of equations. Geometric constructions.

Form of teaching

Language of instruction: English

Assessment

There will be a written examination at the end of the course. 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 component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

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

The syllabus for MMA310 was originally established to take effect from 2007-07-01, when it replaced MAN630, and was revised 2010-07-01.