



DEPARTMENT OF MATHEMATICAL SCIENCES

MMG500 Algebraic Structures, 7.5 credits

Algebraiska strukturer, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2017-11-29 to be valid from 2017-12-01, spring semester of 2018.

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) Bachelor's Programme in Mathematics (N1MAT)

Main field of studies

Mathematics

Specialization

G2F, First Cycle, has at least 60 credits in first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of 60 credits in mathematics.

Learning outcomes

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

- define and use the most important algebraic structures: groups, rings, and fields,
- give examples of groups that consist of congruence classes of integers, matrices, permutations, and symmetries of geometrical objects,
- define and use the concepts of subgroup and coset of subgroup,
- form quotient groups by using normal subgroups,
- define and use the concept of isomorphism between two groups or two rings,
- use the Euclidean algorithm for integers and for polynomials over a field, and the associated theory of unique prime factorization.

Course content

Binary operations. Equivalence relations. Groups, rings, and fields. Number systems. Homomorphisms and quotient structures. Polynomials and polynomial equations. Factorization. Field extensions. Quotients of elements in integral domains.

Form of teaching

The course will be taught in English unless everyone involved speaks Swedish.

Assessment

There is 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 MMG500 was originally established to take effect from 2007-07-01, when it replaced MAN290.