



Course syllabus

Faculty of Technology
Department of Mathematics

2MA405 Algebraiska strukturer I, 7,5 högskolepoäng
Algebraic structures I, 7.5 credits

Main field of study

Mathematics

Subject Group

Mathematics

Level of classification

First Level

Progression

G2F

Date of Ratification

Approved 2014-10-03

Revised 2019-03-13 by Faculty of Technology. The modules are revised.

The course syllabus is valid from autumn semester 2019

Prerequisites

1MA462 Discrete Mathematics 7.5 credits and 1MA451 Linear algebra and Fourier series 7.5 credits or equivalent.

Objectives

After completing the course, the student should be able to

- solve problems, perform calculations, and conduct lines of reasoning within the part of mathematics that is covered by the course, and to communicate these solutions, calculations, and reasonings in writing
- describe definitions, along with formulating and proving theorems that are central to the course.

Content

Group Theory:

Groups and Subgroups. Cyclic Groups. Permutation Groups. Lagrange's Theorem. Fermat's and Euler's Theorems. Homomorphisms and Isomorphisms between Groups. Cayley's Theorem. Normal Subgroups and Quotient Groups. Burnside's Lemma.

Ring Theory:

Rings, Fields and Integral Domains. Homomorphisms and Isomorphisms between Rings. Ideals and Quotient Rings. Polynomial Rings.

Boolean Algebras:

Partially Ordered Sets. Bounded, Distributive, and Complemented Lattices. Boolean

Algebras.

Type of Instruction

Lectures and seminars.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's knowledge is assessed in the form of a written examination.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 2MA105 Algebraic structures I, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

- John A. Beachy, William D. Blair *Abstract Algebra*, 3rd Ed., Waveland Press, 2006 or later. 200 pages (484)
- *Distributed material*, Linnæus University, present year. 35 pages