



Course syllabus

Faculty of Technology

Department of Mathematics

2MA405 Algebraiska strukturer I, 7,5 högskolepoäng

2MA405 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 2023-05-22 by Faculty of Technology. Prerequisites are revised.

The course syllabus is valid from spring semester 2024

Prerequisites

1MA405 Discrete Mathematics and Mathematical Thinking 7.5 credits and 1MA406 Linear A 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.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University. If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Credit Overlap

The course cannot be included in a degree along with the following course/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*, Waveland Press, latest edition. 200 pages (484)
- *Distributed material*, Linnæus University, present year. 35 pages